

Environmental Assessment
of the
Strategic Energy Assessment 2004-2010
Docket 05-ES-102

Purpose of the environmental assessment

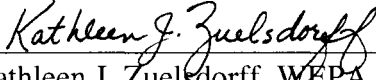
This is the environmental assessment (EA) of the 2004 Strategic Energy Assessment (SEA), which covers the period 2004-2010. The purpose of this EA is to discuss generic issues presented in the SEA and describe their potential environmental impacts as required by Wis. Stat. § 196.491(2)(f). The SEA evaluates the adequacy and reliability of the state's current and future electrical supply. *See* Wis. Stat. § 196.491(2)(a). The Commission will announce the availability of this EA to groups with an active stake in the status of Wisconsin's electric energy future.

SUMMARY

Proposed construction of base-load generation and plans for an extensive upgrade of the transmission system draw attention to the following topics:

- Wisconsin needs a method to continuously capture all economic means for increasing energy efficiency. Increased use of energy efficient appliances and practices will not only reduce environmental impacts, but also benefit Wisconsin's economy.
- County and local government could reduce future environmental impacts by including existing and potential electric facilities in zoning and land use plans.
- Greater efficiency and coordination in the planning and operation of the electric system will reduce environmental impacts and costs.
- Distributed generation can defer construction of expensive power plants and power lines, but there has been little activity in this area. Targeted energy efficiency measures can delay construction of power lines, but there are no programs to implement targeted energy efficiency measures.
- Cogeneration and other combined-cycle power plants, due to their increased efficiency, can reduce environmental impacts related to new plant construction.
- Use of the latest pollution control measures can significantly reduce the air emission impacts of all types of power plants, including large coal plants and small diesel engines.
- Re-use of existing electric facility corridors, as well as corridor-sharing with roads and railroads can reduce environmental impacts, if implemented where appropriate, with the appropriate transmission line design.
- Construction of wind farms in Minnesota and/or Iowa may require construction of high-voltage transmission lines in Wisconsin in the future.

The Strategic Energy Assessment identifies, describes, and assesses different aspects of Wisconsin's electricity picture for the following seven years. This environmental assessment (EA) of the SEA discusses the potential environmental effects of the issues contained in the SEA. This environmental assessment was prepared under Wis. Stat. 196.491(2)(f).



Kathleen J. Zuelsdorff, WEPA Coordinator

Date: May 5, 2004

1. Transmission line and substation construction

Proposed construction

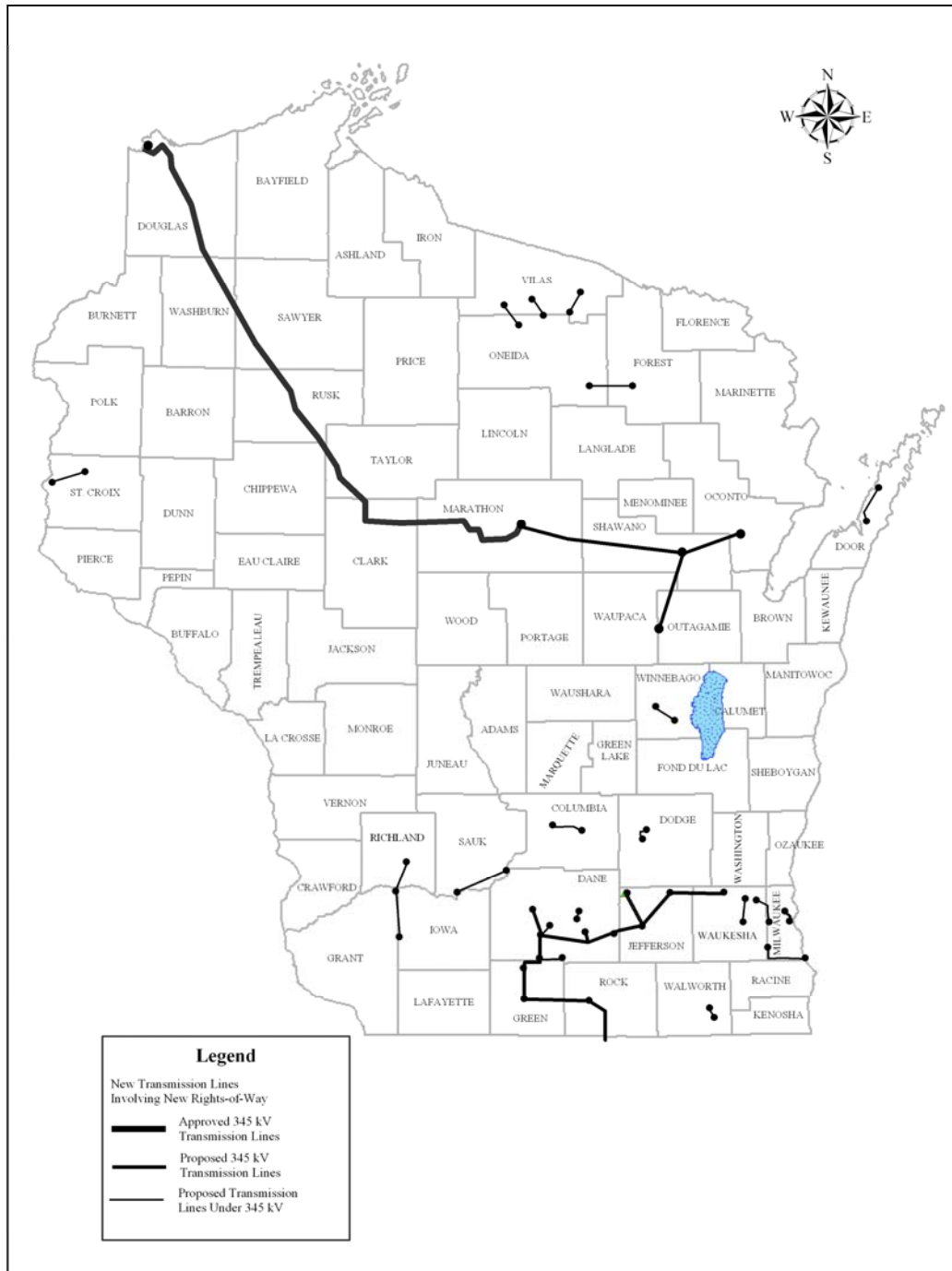
Wisconsin's transmission providers are the ATC (eastern Wisconsin), cooperatives (primarily in southwest Wisconsin), Xcel (northwestern and southwestern Wisconsin), and municipal utilities. The ATC plans 70 major transmission projects in Wisconsin with projected in-service dates before 2010, at a cost of about \$ 1 billion. During the same period, transmission providers in western Wisconsin plan only one transmission project. This amount of planned construction in western Wisconsin may change in the future as the institutions that oversee aspects of western Wisconsin's transmission system evolve.

Transmission system improvements include new power lines and substations, upgrades of existing lines and substations to higher voltages, and rebuilds of older lines and substations to new standards. The SEA lists new power lines and other major projects. The highest voltage line in Wisconsin is 345 kV. It is likely that Wisconsin will need new 345 kV transmission lines (in addition to the approved Arrowhead-Weston 345 kV line) within the next ten years. Figure EA-1 shows potential projects that would require new right-of-way (ROW).

ATC plans a major upgrade of the existing transmission system in central and eastern Wisconsin. The upgrade is due to the aging of existing lines, to the continued growth of Wisconsin energy use, and/or to the changes in the electricity industry. Wisconsin has kept electric rates low in the past by not building excess facilities. However, power transfers between entities that are beyond our state borders now also affect Wisconsin's electric system. Some in-state entities are finding it difficult to buy and sell power out-of-state. These changes are adversely affecting electric rates. The construction of additional in-state generation will help in some situations, but not others.

Figure EA-1

Proposed and Approved High-Voltage Transmission Line Additions
Involving New Rights-of-Way



Alternatives to transmission line construction

There are several reasons for transmission line improvements – some of which allow for non-transmission alternatives. However, much of the proposed construction, especially the rebuilds and upgrades, is needed for reasons that cannot be satisfied by non-transmission alternatives. Table EA-1 shows the major reasons for upgrading the electric system and some possible alternatives.

Some new technologies could offset need for some traditional transmission. Potential new technologies include ac-dc-ac links (two alternating current lines with a section of direct current line between them), and Flexible AC Transmission System (FACTS) controllers, which are control devices located at substations.

By the time that the Commission considers a particular transmission project, energy efficiency measures may not be a viable alternative. There may not be enough time to secure energy efficiency in a large enough quantity. In addition, there are no programs to “target” energy efficiency. Targeted programs are those designed to reduce load growth in specific areas that are creating need for a power line. Generation may also be a limited alternative, due to siting considerations. The institutional arrangement separating transmission ownership from generation ownership creates difficulty in using generation as a substitute for transmission projects, and vice versa.

Changes in the transmission line siting process

Wisconsin Act 89 requires the PSC and DNR to develop a joint process for reviewing applications for transmission facilities. The new state review process is still in the development and testing stages. Act 89 requires important changes in the development of alternative routes, and the inclusion of public comments. These include the following changes in process:

- The transmission provider, the PSC, and the DNR will collaborate much more in defining alternative routes and analyzing the environmental impacts of the project.
- The route alternatives filed in the application will be deemed reasonable and permissible from an environmental perspective by PSC and DNR staff.
- More, detailed information on the route alternatives will be included in applications.
- In order to acquire sufficient information to assess the project impacts, the PSC is authorized to access private property if denied voluntary access, and the PSC can extend this authority to a Commission agent.
- DNR permits for wetland or stream crossings will be issued within 30 days of the PSC order.

| Table EA-1 | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Possible reasons for transmission construction | Possible alternatives that reduce the need for construction or the amount of transmission construction |
| <p><i>Increased electricity use</i></p> <ul style="list-style-type: none"> • Wisconsinites are using more electricity overall • Wisconsinites use more electricity at the same time (peak summer use) • New housing/business developments and industrial parks increase electricity use at new locations <p><i>Increased power transfers and system operating security</i></p> <ul style="list-style-type: none"> • Wisconsin imports about 30 percent of its electric energy • Power transfers in and through Wisconsin have increased • Sales of Wisconsin-produced off-peak power out-of-state can off-set purchase costs • Maintain proper operation of the grid in terms of electrical engineering characteristics (loop flows, phase angles, etc) <p><i>Transmission service for new power plants</i></p> <ul style="list-style-type: none"> • New power plants must be connected to the existing transmission system without degrading the stability or reliability of the existing system • Federal Energy Regulatory Commission (FERC) requires the ATC to provide a transmission system that allows a power plant owner to sell electricity and ancillary services | <ul style="list-style-type: none"> • Electricity users could incorporate energy efficiency in new buildings and appliance purchases • Retail electricity providers could increase load management to decrease peak use • Retail electricity providers, municipalities, cooperatives, et. al. could build more generating plants to serve Wisconsin electric loads. • Retail electricity providers, et. al. could build small power plants near load centers (distributed generation), especially cogeneration plants (that produce electricity and steam) |

Environmental impacts

Proposed transmission improvements will create environmental impacts – both during and after construction. Table EA-2 lists examples of these impacts. For further information, refer to the PSC brochure - Environmental Impacts of Electric Transmission Lines. Electronic copies are available on the internet at www.psc.wi.gov/consumer/electric/overview.htm

The many changes and additions within existing substations, such as transformer additions, and adding capacitors and relays, would have little or no effect on Wisconsin's environment, whereas, new substations or expanded substations would have greater environmental impacts. Their long-term effects include changes in use of the land and the possibility of connections with future transmission lines.

| Table EA-2 Examples of Long- and Short-Term Impacts of Power Line Construction | |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| During construction | After construction |
| Destruction of vegetation, damage to wetlands and crops, loss of yard trees and woodlands | Limits on future right-of-way use, e.g. no buildings or tall trees, no center pivot irrigation |
| Disruption of wildlife habitat | Physical presence, e.g. poles interfering with field plowing, bird collisions with conductors and shield wires |
| Soil erosion, soil compaction, potential run-off into streams and other waterbodies | Fragmentation and loss of wildlife habitat; permanent changes in wetland hydrology |
| Noise and dust affecting the health of people, animals, and plants | Change in aesthetics and visual quality of landscape |

Ways to Minimize Environmental Impacts

Need for local governments to plan and zone for future transmission lines

The extent of ATC's proposed construction program highlights the need for local governments to do a better job of including both existing and potential transmission line and substation locations in planning or zoning studies. In particular, it's important to assess the location of all existing electric line ROW, because new legislation promotes re-use of these corridors for new or upgraded transmission lines. Appendix EA-1 is a list of all the counties and towns in which the ATC has identified the potential need to upgrade the transmission lines on existing ROW.

The responsible officials of the communities listed in Appendix EA-1 should review the information that can be obtained by clicking on "Smart Growth", on the PSC web site (<http://psc.wi.gov>). They should also review information under planning on ATC's site

(atcllc.com). While generally a good idea, use of some existing rights-of-way, such as power lines, railroads, natural gas pipelines, and roads, could increase, rather than decrease environmental impacts.

Factoring environmental data into transmission planning

The Midwest Independent System Operator (MISO) now oversees planning for Wisconsin's transmission system. It is no longer clear how, if at all, environmental factors are incorporated into choosing what electrical solutions to pursue for solving problems on Wisconsin's high-voltage transmission system. This is important because some alternative solutions may have the potential to create less environmental impact than other solutions. For example, one transmission solution may require crossing a major river or habitat area while another does not.

Public input to transmission planning and routing

The ATC solicits comments on proposed transmission lines in its biennial Assessments and holds five public meetings in different areas of the state. Because the ATC has not decided on routes for the facilities listed in the Assessment, specific landowner contacts are not possible. However, the ATC invites comments from local officials, particularly those knowledgeable about local resources.

Once the ATC begins to work on a specific project, individual landowners are contacted. The ATC is developing a process for public outreach that involves contact with all landowners along potential transmission line corridors. During several stages of the routing process, landowners are contacted by mail and phone, and invited to public open houses. Landowner comments are solicited and considered during route development. The ATC appears to favor open house-style public meeting formats rather than more formal large group presentations or question and answer sessions. The project application for high-voltage transmission lines is required to identify two alternate routes for which detailed information is provided.

Siting power plants to reduce the need for new transmission

Neither MISO nor the ATC presently has the means for steering potential power plant developers to sites at which fewer transmission lines are required for interconnection and sales. This is an environmental concern, because the impacts of the associated facilities - transmission lines, natural gas pipelines, or water supply lines may be quite significant in comparison to the impacts at the plant site. In addition, more people may be directly affected by the transmission ROW than the power plant site.

Developers that are non-utility entities must acquire plant sites from willing sellers, while the ATC has the authority to acquire transmission rights-of-way through condemnation.

2. Power plant construction

Proposed construction

The SEA lists generation proposed for construction. One of the reasons for increasing electric rates is the recent construction or approval of several power plants, including gas-fueled power

plants, and two baseload coal units. The Commission is currently reviewing an application for a new coal plant near Wausau. There is concern that Alliant (Wisconsin Power & Light Company) may be low on base-load capacity (power plants that run year-round). Other than a possible baseload proposal from Alliant, there is not likely to be further large generation proposed in Wisconsin for at least ten years. However, Independent Power Producers (IPPs) could propose additional peaking plants and the Commission has ordered additional construction of renewable resources. Retail electric service providers are responsible for providing electricity to Wisconsin customers.

Fuel use

Using different technologies and fuels for generation provides increased reliability to the electric system, since a single problem or issue is unlikely to affect all generation sources. The need for diversity is an argument used by proponents of new coal plants, wind turbines, and distributed generation. From an environmental perspective, the question is how much of each generation source will provide a generation mix with an acceptable cost, level of reliability, and the least overall environmental impact. Cost is an important (and highly controversial) factor that may, or may not favor power sources with fewer environmental impacts.

The Commission recently approved two coal units proposed by Wisconsin Electric Power Company (WEPCO), a subsidiary of Wisconsin Energy Corporation (WEC). Concern about the need for fuel diversity in Wisconsin's generators was an important factor in the Commission's decision.

The availability and price of natural gas is a reliability concern for Wisconsin, because it is the fuel burned by almost all generation proposed and built during recent years. These generators are mostly peaking plants (operated during peak times of electricity use). None are base-load plants (designed to operate year-round), although some are designed for intermediate load conditions. Although natural gas emits fewer types of pollutants than coal plants, it emits similar amounts of pollutants for each kilowatt-hour generated. To increase the firm delivery of natural gas would require the construction of additional gas pipelines and other facilities. (Firm delivery requires that service continue despite gas shortages or delivery problems.)

Many individuals and institutions have bought small generators to provide electrical backup in the event of a power failure. Diesel-fired plants are also likely to be built by small retail electric service providers, such as municipalities.

Alternatives to building new generating facilities

The PSC cannot consider potential supply alternatives for power plants proposed by IPPs. For plants proposed by Wisconsin utilities or their associated business affiliates, the PSC could consider increased energy efficiency, increased load management, smaller or larger units, different fuels, and use of renewable resources.

Wisconsin's energy priorities

The Energy Priorities Law (Wis. Stat. § 1.12) establishes a state policy regarding the options that should be considered in meeting energy demands. The policy is that, to the extent cost-effective and technically feasible, the priorities of the state in meeting energy demands should be:

1. Energy conservation and efficiency
2. Noncombustible renewable energy resources
3. Combustible renewable energy resources
4. Nonrenewable combustible energy resources, in the order listed:
 - a. Natural gas
 - b. Oil or coal with a sulphur content of less than 1 percent
 - c. All other carbon-based fuels

These priorities are listed in order from least environmental impact to most. Recent changes in legislation make it difficult, however, for the Commission to implement a higher energy priority as an alternative to a proposed, traditional power plant. By the time an application for a traditional plant is submitted, there may not be enough time to secure energy efficiency or renewable resources in a quantity large enough to have much impact on the proposed project. This means that energy efficiency and renewable resources alternatives must be given full consideration during the generation planning process for meeting specific or local area needs. As a partial remedy for this problem, the Commission recently order a utility to achieve specific increases in efficiency and renewable resources as a condition of approving construction of a new, traditional power plant.

From an environmental and rates standpoint, it's important to ensure that over the long range there is more consistency in capturing all cost-effective energy efficiency measures. By capturing the most cost-efficient measures at all times, more money will stay in Wisconsin, electric bills will be lower, fewer pollutants will enter the air, and greenhouse gas emissions which lead to global climate changes will be reduced.

Reducing the Reserve Margin

The Commission requires utilities to have the ability to serve more than their expected customer loads. This extra capacity reduces the risk of unexpected generation problems. Extra capacity also translates into greater environmental impacts, due to increased facility construction in Wisconsin or elsewhere. However, reliability may capture some environmental benefits. If the electric system is not reliable, people may rely more on highly polluting methods of obtaining heat or electricity – which include small, diesel turbines, and wood stoves.

Utilities calculate reserve margin as an additional percentage of expected future peak. The Commission currently requires a reserve margin of 18 percent. However, the Commission last considered an analysis of appropriate reserve margin for Wisconsin utilities in 1998. For this SEA, the Commission asked the major distribution utilities whether they thought that 18 percent remained an appropriate number for all utilities. Most suggested that the desirability of this number needs periodic review, especially as the MISO transmission markets develop. WEPCO wanted 20 percent while other utilities were satisfied with 18 percent.

It's important from an environmental standpoint to identify how much reliability customers want, and how much is actually gained by any particular proposal. The better these definitions are, the more likely that construction and related environmental impacts will be minimized.

Adding 345 kV transmission lines

Adding 345 kV lines could allow significantly increased imports of power from out of state, thereby reducing the need for new generation in Wisconsin. However, the existing transmission system would still need rebuilding and upgrading to balance the load and the generation operations in the upper Midwest. In addition, because Wisconsin receives air-born pollutants from other states, it is unlikely that all of the impacts associated with generation could be avoided.

Wind farms in Minnesota or northern Iowa and high voltage transmission lines in Wisconsin

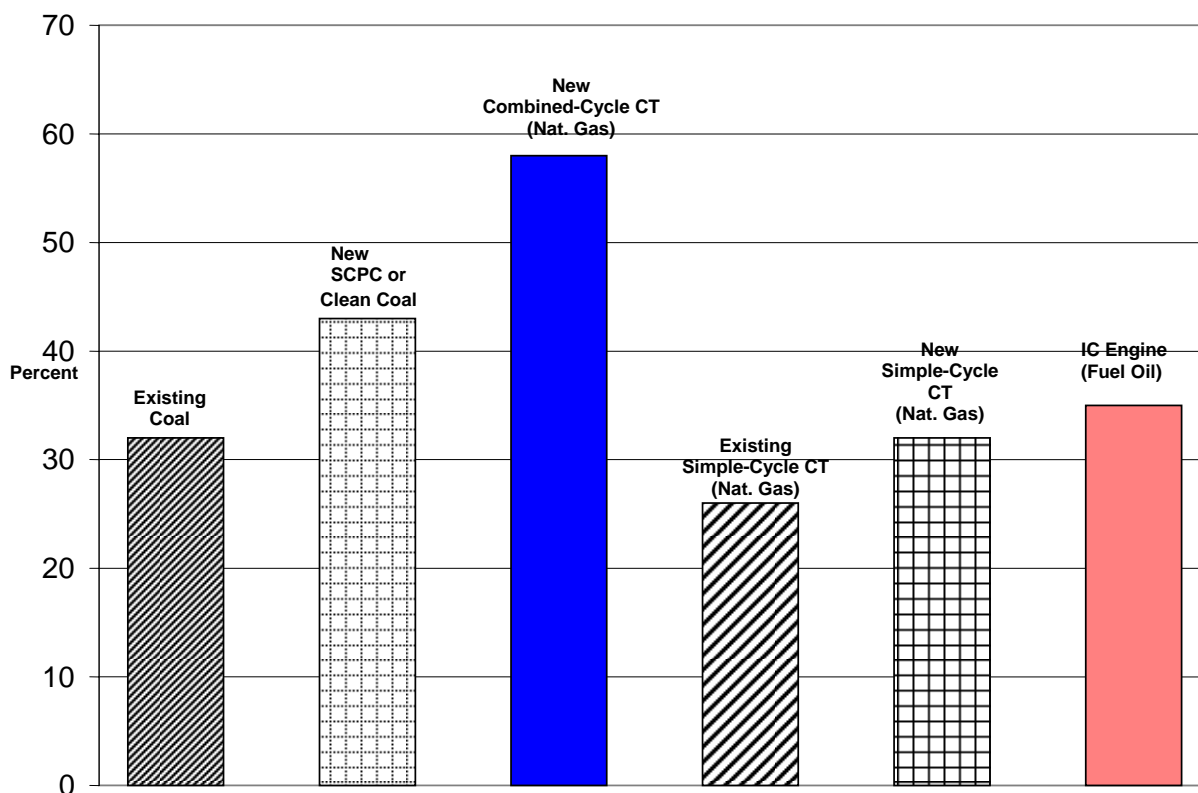
Wind turbine farms generating thousands of MW in western Minnesota and/or northern Iowa could require new transmission lines up to 500kV in size to deliver the power to Wisconsin and locations further east.

Environmental effects of fossil-fueled generating plants

Generating plants that use fossil fuels are one of the sources for the air pollutants that cause or exacerbate asthma and other lung diseases. Figure EA-2 shows the relative efficiencies of different types of fuels and generating plants. The more efficient a plant, the fewer pollutants produced per amount of electricity generated. The use of up-to-date air pollution controls is important for reducing environmental impacts, regardless of the type of fuel used, or the type of power plant.

The emission of greenhouse gases (GHG), including CO₂, from fossil-fuel generating plants also must be recognized as one of their most significant impacts. (At this time, GHG are an unregulated air emission.) The combustion of fossil fuels to produce energy is a major source of GHG in Wisconsin and the United States, accounting for 80 to 90 percent of emissions. Increasing amount of CO₂ and other GHG in the atmosphere are likely to have significant impacts on the environment and human health everywhere on the planet, due to temperature and weather-related effects. Localized impacts could include warmer weather with increased frequencies of droughts, floods, heat waves, and severe weather events, decreasing water levels and water quality in the Great Lakes and inland waters of the state, ecosystem changes due to climate changes, decreased crop productivity, increased potential for forest fires, and increased potential for insect-borne diseases. Global climate changes would include these impacts on a much broader scale, in addition, to many others effects.

Figure EA-2
Power Plant Efficiencies (%)



Natural gas-fired power plants

Natural gas-fired power plants have little difficulty meeting current standards for emission of air pollutants. For these plants, the potential environmental impacts of most concern are the effects of land use compatibility and the impacts related to the associated facilities, such as water intake/discharge structures, water lines, electric transmission lines, and natural gas pipelines. In addition, depending on the plant location, concerns may center on noise, vibrations, traffic, and visual effects close to the plant site. People living near proposed natural gas-fired power plant sites are often concerned about negative effects on their property values, due to noise levels, and plant site aesthetics.

Coal-fired power plants

Coal-fired power plants cause greater environmental effects than natural gas-fired plants. Coal-fired plants produce sulfur dioxide, a regulated air pollutant, and mercury, for which the Wisconsin DNR is proposing emission rules. Coal plants also produce a significant amount of waste in the form of ash and/or sludge, which must be recycled or placed in a landfill with appropriate lining. In addition, there are environmental effects associated with coal mining, delivery, storage, and handling and the huge quantity of water needed for cooling.

Diesel-fired power plants

Among the fossil fuel-fired power plants, those fueled by diesel (fuel oil) produce the most air pollutants per unit of electricity. The use of diesel-fired power plants is increasing, because they are an economic choice for distributed generation (small units located near users), peak generation, and emergency back-up generation. These units do not need natural gas pipelines, large electric lines, or water lines. They usually connect directly to the substations or transformers that serve load. Because these units are small, pollution control devices are usually not needed to meet air emission standards. However, when looking at the amount of air pollutants produced per unit of electricity, the importance of air pollution controls becomes evident. In addition, diesel units are most likely to be operated during peak energy demand periods such as hot, humid summer days when air quality concerns already exist.

Power plant siting

The PSC requires power plant developers to identify, and provide information for alternative power plant locations. The PSC also requires a power plant application to include a discussion of the criteria and methods used to identify and choose a proposed site.

Two new laws affect the environmental impact of siting power plants. One law promotes the use of brownfield sites. Virtually all existing power plant sites could fit this definition. Other brownfield sites are not necessarily located near existing transmission line substations, gas pipelines, water sources, or major highways – some or all of which are needed by traditional power plants.

The second statute increases the amount of compensation provided to local governments in whose jurisdiction new generation facilities are built. The provision for generation defines the affected local jurisdiction as the site of the generating unit itself, but does not take into consideration the ancillary facilities, which may have significant environmental impacts. These facilities may be located in another jurisdiction that does not receive, or receives less, compensation.

Reducing the environmental impact of power plants

Building more power plants and building base-load plants

Building more power plants could improve the overall air quality in Wisconsin for two reasons. First, the lack of new power plants and the constraints on the existing transmission system are causing utilities and other generation owners to postpone retiring older plants. Generally, older power plants have lower efficiencies and less effective pollution controls than newer power plants. Second, owners may be operating their existing plants more often than recommended for the plant design. Engineers design power plants for a particular mode of operation, and design pollution controls to work optimally for that mode of operation. Increased plant operation could decrease the effectiveness of pollution control equipment. New generation would speed retirement of aged generation and allow optimal operation of existing generation. Base-load generating units are also generally more efficient (produce more electricity from the same amount of fuel) than intermediate or peaking units.

Increasing the efficiencies of energy use

Energy efficiency means reducing energy use at any time and/or during peak times of energy use through methods such as: purchase of more efficient appliances, improvement in industrial processes, insulation, building codes, etc. The resulting energy and demand savings reduce the need for new power plants and transmission lines. This also keeps more money within the state. The funding and administration of programs to promote energy efficiency have changed in the last few years, allowing some funds to be diverted to other purposes. Governor Doyle has appointed an Energy Efficiency and Renewables Task Force to generate “ideas for restoring Wisconsin leadership in conservation and renewable energy.” While energy efficiency is highly desirable from an environmental and social viewpoint, it is likely not sufficient to meet all of the continuing growth in Wisconsin’s energy use.

Increasing the efficiencies of energy production

Since combined-cycle plants increase the efficiency of fuel use, the increase in these types of units could reduce the amount of all pollutants produced per unit of usable electricity. Cogeneration is a type of combined-cycle plant that produces steam in addition to electricity. This steam may be used for industrial processes or district heating. Madison Gas and Electric Company is building a cogeneration plant (132 MW of natural gas-fired cogeneration) on the University of Wisconsin-Madison (UW-Madison) campus.

Increased use of renewable resources

Most renewable energy resources are environmentally preferable to the combustion of fossil fuels. Most money spent on these resources remains in Wisconsin. Wisconsin law requires electricity providers to obtain up to 2.2 percent of the power they sell at retail from renewable resources by 2011. A recent UW-Madison study states that increasing the portion of renewable resources to 10 percent could decrease pollutants significantly for an increase of about ten cents on the average household monthly electric bill. The Commission asked the major utilities for their analysis of the cost of a 10 percent “Renewable Portfolio Standard.” Utilities calculated the cost to be considerably higher than in the UW-Madison study.

Utilities are satisfying the current requirement for renewable resources with wind turbines, which contribute less toward reliability than fossil fuels, because their output depends on the wind. PSC staff credits 20 MW out of 100 MW of wind generation toward the reserve margin, while traditional fossil fuels get 100 percent credit. (Utilities credit from zero to 15 percent of wind toward reserve margins).

Renewable resources do have environmental impacts. Wind generators can create a hazard for birds. Wind turbine farms generating thousands of MW in western Minnesota and northern Iowa could require new high-voltage transmission lines (up to 500 kV) to get the power to Wisconsin and further east. Combustion of biomass produces carbon dioxide, because it is a fossil fuel. Biomass includes wood, wood and paper waste, herbaceous plants, plant products, biogas from landfills, wastewater treatment, and on-farm anaerobic digestion of manure. Closed loop systems, in which biomass fuel is continually planted to replace the biomass consumed, would contribute very little additional CO₂ to the atmosphere.

Increased construction of distributed generation

Distributed generation means placing electric generation near commercial or industrial customers. This provides the customer with supplemental and backup power, as well as supplying power to the utility grid. The energy source for distributed generation can be renewable (solar, wind, solid biomass, or biogas) or traditional (natural gas, diesel, or oil). The environmental impact depends on the type of fuel and pollution control equipment. The number of jobs created would likely be greater than for traditional generation. Distributed generation would increase reliability by increasing the number of generating units, and potentially by increasing types of technology used and fuel diversity. However, there is not yet enough distributed generation to affect reliability calculations. Wis. Admin. Code ch. PSC 119 sets out the requirements for interconnecting distributed generation to the electric system.

Mitigation of environmental impacts through negotiation by local officials

The Commission can modify any proposal before it, and every Commission order that approves a power plant includes requirements for measures to mitigate environmental impacts. In recent years, the Commission has encouraged generation providers to work with local governments to develop agreements regarding the mitigation measures for impacts that most affect the local populace. Examples of local impacts are noise, aesthetics, and effects on local traffic. In many instances, construction of a power plant requires the review or approval of local land use or zoning entities, in addition to local permits, such as those for temporary road closings. The amount of money that a generation provider gives the local community as compensation is often part of such negotiations.

Negotiation of agreements between local governments and generation providers has both advantages and disadvantages. The advantages are:

- The appropriate mitigation measure or plan may depend on local tastes or preferences (such as the color of siding on buildings)
- The local community may want stricter controls over some portion of the plant's impacts than is generally regulated (such as lower decibel levels during parts of the day)
- The Commission doesn't need to review and approve every small detail of plant design
- The Commission doesn't have to mediate between the power plant developer and local citizens unless a major conflict arises.

The disadvantages are:

- If the local community negotiates with a generation developer before the Commission issues its Environmental Impact Statement, the community will not have the advantage of a professional analysis of need, alternatives, and impacts
- Officials negotiating with the generation provider may not represent the concerns of the citizens closest to the plant site
- Local officials may not have the skills or resources needed to negotiate with the generation provider
- Local officials may agree to a less environmentally strict standard than the Commission would have, in the absence of a negotiated agreement

- Local actions may effectively limit the Commission's consideration of alternatives
- Community officials may bargain away the community's ability or an individual's ability to take a neutral or negative stand on a power plant proposal
- Local officials may negotiate on subjects inappropriate to local decision-making

Barriers to consideration of all environmental factors

Wisconsin's statutes contain a fundamental conflict that affects the environmental impacts of siting power plants. The statute requires the Commission to consider, for approval and siting, the impacts of a facility (power plant) on "public health and welfare." In addition, the statute denies the Commission the right to consider these impacts if the proposed facility meets federal and state air-emission standards.

Some experts question whether current air emission standards do an adequate job of protecting public health and welfare. Some pollutants, such as CO₂ and particulate matter less than 2.5 microns in diameter are not regulated, although the adverse effects of these emissions are generally well-recognized. Given the larger responsibilities of the Commission to choose among sites and technology alternatives, it seems unreasonable to limit one aspect of power plant siting from consideration.

3. The relation between transmission lines and power plants

Restructuring is part of the changes that have occurred in the electricity industry. This means that in any one area, no entity now necessarily owns all parts of the electric system, although the electric system functions as one unit. In southern and eastern Wisconsin, a single transmission provider owns the transmission lines. Distribution providers own the distribution system and may own some, all, or none of the generation from which they get power.

Coordinating construction to minimize environmental impacts

One problem with this arrangement is that it's more difficult to coordinate the planning of all parts of the system. The more that construction projects are coordinated through planning, the less likely there is to be excess construction of power plants and power lines, with their associated costs, and environmental impacts. One of the reasons for Wisconsin's low rates in the past was that Wisconsin utilities worked together with the Commission to plan a least-cost energy system.

In its filing requirements for the SEA, the Commission asked major utilities to respond to a question about the coordination of construction. The question was, "Should the planning processes for generation and transmission be integrated in a way that optimizes (efficiently balancing cost and environmental impact) the G&T infrastructure? If so, how should that be done? If not, why not?" In general, respondents thought that would be a good idea, but perhaps difficult to achieve, given the current state of the electric industry. The Commission will consider the potential methods suggested by the respondents, as described in the SEA.

State representation on the regional and federal levels

The Wisconsin Commission has increased its activities at the regional and federal level in order to represent Wisconsin's cost and reliability interests. In the future, the Commission may also have to represent Wisconsin's environmental interests. Wisconsin has a history of valuing its environmental resources, some of which are unique. Wisconsin also has an important tourist industry that relies on the quality of its natural resources.

The Wisconsin Commission has been active in the formation and policy development for the Organization of Midwest States (OMS). This group, formed in 2003, coordinates regulatory oversight among the states and makes policy recommendations to appropriate parties. It or individual states may intervene in appropriate proceedings. In addition to OMS, the Commission reviews, comments, and/or intervenes in FERC dockets, participates in the National Association of Regulatory Utility Commissioners (NARUC), the Mid-Continent Area Power Pool (MAPP), the Mid-America Interconnected Network (MAIN), and MISO activities, including the Midwest Market Initiative. The Commission has also organized a monthly meeting that allows Wisconsin stakeholders to discuss the potential effects to Wisconsin of proposed changes in the electric industry, and develop consensus on state positions.

The Commission asked the major distribution providers whether it was doing an adequate job addressing the developments at the regional and federal level that affect Wisconsin's electric services. The reply was that Commission's work was useful and that it must continue.

Power transfer capability

There is a basic environmental trade-off between the environmental impacts of building power plants to meet energy needs and the environmental impacts of building power lines to import needed energy. Wisconsin still imports a significant amount of its energy needs, and the electric system has sufficient capability to meet those needs. For 2004-2010, imports will decline due to the construction of new power plants in Wisconsin.

The Commission asked major distribution providers their opinion about the appropriate transfer capability for Wisconsin's electric transmission system. Wisconsin is on track to meet the transfer goals set in the Wisconsin utilities' latest study on the cost/benefits of different transfer capabilities. Most respondents continue to agree with these goals. The Commission may revisit the question regarding appropriate transfer levels, once market rules and federal reliability standards are known. The subject of power transfer is complex. In any future studies, it will be important to make sure that environmental costs are factored into any cost-benefit analyses.

Identifying transmission lines needed by a proposed power plant

The presence of electric transmission lines on or near a proposed power plant site may not mean that the proposed plant would require no new transmission. The geographic location of the power plant is not as important to the electric system as other factors. The generator's purposes and its relationships to the regional electric system are important. Only interconnection studies by the MISO or transmission providers can identify the transmission improvements needed to place a new power plant on the electric system, without degrading the existing system's reliability or stability. If reliability is degraded, the likelihood of potential service outages

increases. If stability is degraded, the likelihood of potentially removing large portions of the electric system from service (i.e. “cascading outages”) increases.

When the PSC prepares an EIS or EA on a proposed power plant, the EIS or EA includes a discussion of the potential environmental impacts of the plant’s associated facilities, such as natural gas pipelines, water pipelines, and electric transmission construction. To identify the potential electric lines needed for interconnection and power sales, the PSC requires the power plant application to include interconnection studies.

The interconnection studies include a number of computer runs summarized in three categories: short-circuit study, stability study, and thermal study. Interconnection studies show what transmission improvements are needed to allow the proposed plant to connect to the existing system. These studies dictate what improvements are needed to keep the system reliable and stable. A Transmission Service Study identifies changes needed to allow a plant to make power sales or offer other ancillary services to different customers. All of these studies include many assumptions about electricity load levels, power transfers, and power plant operations.

Environmental and landowner information

Depending on the timing of transmission improvements needed for a proposed power plant, landowners along potential power line routes may or may not be involved in the power plant review process, and general or detailed environmental information on the power line routes may be available for Commission consideration of the power plant application.

Ideally, if transmission line(s) are required to interconnect and dispatch the power plant, the transmission provider would apply for approval of these transmission improvements at the same time that the power plant developer applies for approval of the plant. The transmission application would include detailed environmental information. A few times in the past, transmission applications have been delayed due to the transmission provider’s workload, and detailed information has not been available nor have potentially affected landowners received individual notices.

If transmission improvements requested for power sales are needed two or three years after the power plant’s in-service date, or if the improvements are dependent on other generation not yet in-service, the Commission reviews the transmission projects and their general environmental impacts when considering the power plant application. No specific transmission routes are identified, nor are individual landowners notified during the power plant review process. Later, when the transmission provider has more up-to-date knowledge about other power plants and does further studies to select the best solution, it identifies possible corridors and holds public meetings. The transmission provider meets with the PSC and DNR to review the results of the public meeting before filing a construction application (if necessary).

One of the problems with separating transmission and generation concerns the potential use of condemnation as a means of acquiring electric transmission line right-of-way to serve a power plant built by a private developer. The Draft SEA discusses a way to alleviate this problem through legislation.

SUMMARY

It's difficult to analyze the environmental impacts of electricity production, because of the increasing complexity of the industry due to deregulation. Some trends have both good and poor environmental aspects, and it's unclear which will predominate over time. The Federal Energy Regulatory Commission is still making decisions about the appropriate use of the electric system and the assignment of costs. Different entities are still forming and defining their responsibilities.

The role of the Public Service Commission is undergoing a change. The Commission continues to approve projects that it determines are in the public interest for Wisconsin. However, the Commission now also works to educate and coordinate various Wisconsin and Midwestern entities, and to make sure that information about Wisconsin energy costs and Wisconsin environmental values is available to federal decision-makers.

From an environmental perspective, concepts such as market value and reliability, translate into actual facilities that affect human and environmental health. The environment will only benefit to the extent that the different entities that exercise control over the electric system work well together to create an efficient electric system – one that does not encourage the construction of excess facilities. It's also important that when a facility is needed, environmental factors play an important role in its location and design.

The siting of every facility requires a balancing or trade-off of various environmental, design, and cost factors. The Commission has a tradition of valuing public involvement in this process. Recent Wisconsin legislation may greatly affect the way in which citizens are involved in siting electric and gas facilities.

Appendix EA-1

Municipal Civil Divisions within which potential re-use of an existing transmission line right-of-way is identified before 2011

| County | City/Village/Town | MCD Name |
|----------|-------------------|------------------|
| BROWN | V | Pulaski |
| COLUMBIA | T | CALEDONIA |
| | T | DEKORRA |
| | T | LOWVILLE |
| | T | OTSEGO |
| | T | PACIFIC |
| | T | SPRINGVALE |
| | T | WEST POINT |
| | T | WYOCENA |
| | V | Rio |
| | V | Wyocena |
| DANE | C | Fitchburg |
| | C | Madison |
| | C | Middleton |
| | C | Monona |
| | C | Verona |
| | T | ALBION |
| | T | BERRY |
| | T | BLOOMING GROVE |
| | T | BURKE |
| | T | CHRISTIANA |
| | T | COTTAGE GROVE |
| | T | CROSS PLAINS |
| | T | DEERFIELD |
| | T | DUNKIRK |
| | T | DUNN |
| | T | MADISON |
| | T | MAZOMANIE |
| | T | MEDINA |
| | T | MIDDLETON |
| | T | MONTROSE |
| | T | OREGON |
| | T | PLEASANT SPRINGS |
| | T | PRIMROSE |
| | T | ROXBURY |
| | T | RUTLAND |
| | T | SPRINGDALE |
| | T | SPRINGFIELD |
| | T | VERONA |
| | T | WESTPORT |
| | V | Belleville |
| | V | Brooklyn |
| | V | Cambridge |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|--------|-------------------|-----------------|
| DANE | V | Cottage Grove |
| | V | Cross Plains |
| | V | Deerfield |
| | V | Maple Bluff |
| | V | McFarland |
| | V | Oregon |
| | V | Rockdale |
| | V | Shorewood Hills |
| DODGE | C | Beaver Dam |
| | C | Watertown |
| | T | ASHIPPUN |
| | T | BEAVER DAM |
| | T | CALAMUS |
| | T | EMMET |
| | T | LEBANON |
| | T | PORTLAND |
| | T | TRENTON |
| | T | WESTFORD |
| DOOR | C | Sturgeon Bay |
| | T | CLAY BANKS |
| | T | SEVASTOPOL |
| | T | STURGEON BAY |
| GRANT | T | CASSVILLE |
| | T | CASTLE ROCK |
| | T | CLIFTON |
| | T | MUSCODA |
| | T | WINGVILLE |
| | V | Cassville |
| | V | Montfort |
| | V | Muscoda |
| GREEN | T | ALBANY |
| | T | BROOKLYN |
| | T | DECATUR |
| | T | EXETER |
| | V | Albany |
| | V | Belleville |
| | V | Brooklyn |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|-----------|-------------------|---------------|
| IOWA | T | ARENA |
| | T | EDEN |
| | T | HIGHLAND |
| | T | MIFFLIN |
| | T | PULASKI |
| | T | WYOMING |
| | V | Arena |
| | V | Highland |
| | V | Montfort |
| | V | Muscoda |
| JEFFERSON | C | Jefferson |
| | C | Lake Mills |
| | C | Waterloo |
| | C | Watertown |
| | T | AZTALAN |
| | T | IXONIA |
| | T | JEFFERSON |
| | T | LAKE MILLS |
| | T | MILFORD |
| | T | OAKLAND |
| | T | SUMNER |
| | T | WATERLOO |
| | T | WATERTOWN |
| | V | Cambridge |
| KENOSHA | T | BRISTOL |
| | T | RANDALL |
| | T | SALEM |
| | T | WHEATLAND |
| | V | Paddock Lake |
| | V | Silver Lake |
| | V | Twin Lakes |
| LINCOLN | T | HARRISON |
| | T | KING |
| | T | SKANAWAN |
| MARATHON | V | Elderon |
| | V | Hatley |
| | V | Kronenwetter |
| | V | Marathon City |
| | V | Rothschild |
| | V | Weston |
| | T | BEVENT |
| | T | ELDERON |
| | T | FRANZEN |
| | T | GUENTHER |
| | T | KNOWLTON |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|-----------|-------------------|-----------------|
| | T | MOSINEE |
| | T | REID |
| | T | RIB MOUNTAIN |
| | T | RINGLE |
| MILWAUKEE | C | Franklin |
| | C | Greenfield |
| | C | Milwaukee |
| | C | Oak Creek |
| | C | South Milwaukee |
| | C | West Allis |
| | V | Greendale |
| | V | Hales Corners |
| OCONTO | C | Gillett |
| | C | Oconto Falls |
| | T | ABRAMS |
| | T | CHASE |
| | T | GILLETT |
| | T | MORGAN |
| | T | OCONTO FALLS |
| | T | STILES |
| ONEIDA | C | Rhineland |
| | T | CRESCENT |
| | T | ENTERPRISE |
| | T | LAKE TOMAHAWK |
| | T | MINOCQUA |
| | T | NEWBOLD |
| | T | PELICAN |
| | T | PINE LAKE |
| | T | SUGAR CAMP |
| | T | WOODRUFF |
| OUTAGAMIE | C | New London |
| | T | BLACK CREEK |
| | T | BOVINA |
| | T | CICERO |
| | T | DEER CREEK |
| | T | ELLINGTON |
| | T | HORTONIA |
| | T | LIBERTY |
| | T | MAINE |
| | T | MAPLE CREEK |
| | V | Bear Creek |
| | V | Nichols |
| | V | Shiocton |
| PORTAGE | V | Milladore |
| | T | CARSON |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|-----------|-------------------|-----------------|
| RACINE | C | Racine |
| | T | CALEDONIA |
| | T | MOUNT PLEASANT |
| | T | NORWAY |
| | T | RAYMOND |
| | V | Elmwood Park |
| | V | Sturtevant |
| RICHLAND | C | Richland Center |
| | T | DAYTON |
| | T | EAGLE |
| | T | ORION |
| | T | RICHLAND |
| | T | ROCKBRIDGE |
| ROCK | C | Beloit |
| | C | Evansville |
| | C | Janesville |
| | T | AVON |
| | T | BELOIT |
| | T | CENTER |
| | T | JANESVILLE |
| | T | MAGNOLIA |
| | T | NEWARK |
| | T | PLYMOUTH |
| | T | PORTER |
| | T | ROCK |
| | T | SPRING VALLEY |
| | T | TURTLE |
| | T | UNION |
| | V | Footville |
| | V | Orfordville |
| ST. CROIX | T | RICHMOND |
| | T | ST. JOSEPH |
| | C | New Richmond |
| SAUK | C | Reedsburg |
| | T | FRANKLIN |
| | T | HONEY CREEK |
| | T | MERRIMAC |
| | T | PRAIRIE DU SAC |
| | T | REEDSBURG |
| | T | SPRING GREEN |
| | T | SUMPTER |
| | T | TROY |
| | T | WINFIELD |
| | V | Prairie du Sac |
| | V | Sauk City |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|-----------|-------------------|------------------|
| SHAWANO | V | Spring Green |
| | T | ANGELICA |
| | T | BELLE PLAINE |
| | T | BIRNAMWOOD |
| | T | FAIRBANKS |
| | T | GRANT |
| | T | GERMANIA |
| | T | GREEN VALLEY |
| | T | HARTLAND |
| | T | HERMAN |
| | T | LESSOR |
| | T | MAPLE GROVE |
| | T | MORRIS |
| | T | NAVARINO |
| | T | PELLA |
| | T | RICHMOND |
| | T | SENECA |
| | T | WASHINGTON |
| | T | WAUKECHON |
| | T | WITTENBERG |
| | V | Bonduel |
| | V | Tigerton |
| | V | Wittenberg |
| SHEBOYGAN | C | Plymouth |
| | C | Sheboygan |
| | C | Sheboygan Falls |
| | T | HERMAN |
| | T | LIMA |
| | T | MOSEL |
| | T | PLYMOUTH |
| | T | SHEBOYGAN |
| | T | SHEBOYGAN FALLS |
| | T | WILSON |
| | V | Howards Grove |
| | V | Kohler |
| VILAS | C | Eagle River |
| | T | ARBOR VITAE |
| | T | BOULDER JUNCTION |
| | T | CLOVERLAND |
| | T | CONOVER |
| | T | LAC DU FLAMBEAU |
| | T | LINCOLN |
| | T | HELPS |
| | T | PLUM LAKE |
| | T | ST. GERMAIN |
| | T | WASHINGTON |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|------------|-------------------|-----------------|
| WALWORTH | C | Delavan |
| | C | Lake Geneva |
| | T | BLOOMFIELD |
| | T | DARIEN |
| | T | DELAVAN |
| | T | GENEVA |
| | T | LINN |
| | T | LYONS |
| | T | SHARON |
| | T | WALWORTH |
| | V | Darien |
| WASHINGTON | T | ERIN |
| WAUKESHA | C | Brookfield |
| | C | Muskego |
| | C | New Berlin |
| | C | Oconomowoc |
| | C | Pewaukee |
| | C | Waukesha |
| | T | BROOKFIELD |
| | T | LISBON |
| | T | MERTON |
| | T | OCONOMOWOC |
| | T | WAUKESHA |
| | V | Chenequa |
| | V | Lac La Belle |
| | V | Lannon |
| | V | Menomonee Falls |
| | V | Merton |
| | V | Pewaukee |
| | V | Sussex |
| WAUPACA | C | New London |
| | T | BEAR CREEK |
| | T | LEBANON |
| | T | LITTLE WOLF |
| | T | MATTESON |
| | T | MUKWA |
| WINNEBAGO | C | Omro |
| | C | Oshkosh |
| | T | ALGOMA |
| | T | NEKIMI |
| | T | OMRO |
| | T | RUSHFORD |
| | T | UTICA |
| | T | WINNECONNE |

Appendix EA-1

| County | City/Village/Town | MCD Name |
|--------|-------------------|------------------|
| WOOD | C | Marshfield |
| | C | Stevens Point |
| | C | Wisconsin Rapids |
| | T | ARPIN |
| | T | HANSEN |
| | T | MILLADORE |
| | T | RUDOLPH |
| | T | SHERRI |
| | T | SIGEL |
| | V | Arpin |
| | V | Vesper |